

natural

Natural Connection

Version 4.1.2

Natural Connection



| This document applies to Natural Connection Version 4.1.2 and to all subsequent releases. |
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Natural Connection - Overview

Natural Connection provides an access method required for transferring data, reports, Natural objects and sources from a Natural mainframe computer to a PC. The prerequisite for the use of Natural Connection is Entire Connection.

Related topic:

For information on Entire Connection, refer to the relevant documentation.

The following topics are covered in this documentation:

| • | Main Functionality | Describes the main functionality that is relevant for the mainframe . |
|---|-------------------------------------|---|
| • | Installing Natural Connection | Describes how to install Natural Connection on a mainframe. |
| 3 | Preparing to Use Natural Connection | Describes the tasks that must be accomplished to allow download and upload. |
| 3 | Natural Statements | Describes the Natural statements that are relevant for processing information between the mainframe and the PC by using Natural Connection. |
| • | Processing Work Files | Describes restrictions on the use of work file attributes, the support of work file formats and the impact of READ loops. |

Main Functionality - Natural Connection

This section describes the main functionality provided by Natural Connection that is relevant for the mainframe:

- Interactive Data Transfer
- Integration
- Security

For details regarding the features of the PC component, see the Entire Connection documentation.

Interactive Data Transfer

Data can be downloaded to and uploaded from the PC directly to/from an online program.

Data transfer and conversion to many formats (for example, Lotus 1-2-3, dBASE, ASCII, HTML, XML, Basic, DIF, Binary) is performed in one step. Sophisticated compression techniques are used.

Integration

Using Natural Connection, you can create integrated applications that use both mainframe and PC resources.

For example, Super Natural creates files that you can then further process on the PC. Con-nect uses Natural Connection to exchange documents with the PC. In this way, graphics, spreadsheets, or binary data can be distributed to other users.

Mainframe applications can use PC printers.

Security

A key consideration for any information network is effective security and control. Natural Security on the mainframe provides comprehensive control facilities.

Detailed security profiles are assigned on a user-by-user basis to control access to data and programs.

Other significant objects secured are the individual keywords in the Natural syntax. This can restrict some users, for example, to retrieving data from mainframe databases, while others have the full capability for retrieval and update of mainframe data.

Natural Security also protects against excessive use of system resources by individual users. This is vital when PC users may be employing powerful mainframe features for the first time.

As an additional safeguard, Natural Connection can also encrypt all data downloaded from Natural.

Installing Natural Connection

This section describes how to install Natural Connection under the operating systems OS/390, VSE/ESA, BS2000/OSD and VM/CMS:

- General Information
- Installation Tape OS/390
- Installation Tape VSE/ESA
- Installation Tape BS2000/OSD
- Installation Tape VM/CMS
- Installation Procedure
- Installation Verification

General Information

The section below covers the following topics:

- Prerequisites
- Installation Jobs
- Using System Maintenance Aid

Prerequisites

To use Natural Connection, Entire Connection must be installed.

For further information, refer to the products and versions specified under Natural and Other Software AG Products and Operating/Teleprocessing Systems Required in the current Natural Release Notes for Mainframes.

Installation Jobs

The installation of Software AG products is performed by installation jobs. These jobs are either created manually or generated by System Maintenance Aid (SMA).

For each step of the installation procedure described below, the job number of a job performing the respective task is indicated. This job number refers to an installation job generated by SMA. If you are not using SMA, an example installation job of the same number is provided in the job library on the Natural installation tape; you must adapt this example job to your requirements. The job numbers on the tape are preceded by a product code (for example, NTCI080).

Using System Maintenance Aid

For information on using Software AG's System Maintenance Aid (SMA) for the installation process, refer to the System Maintenance Aid documentation.

Installation Tape - OS/390

The installation tape contains the dataset listed in the table below. The sequence of the dataset is shown in the Report of Tape Creation which accompanies the installation tape.

| Dataset Name | Contents |
|---------------------|----------------------------------|
| NTCnnn.LOAD | Natural Connection load modules. |

The notation *nnn* in the dataset name represents the version number of the product.

Copying the Tape Contents to Disk

If you are using System Maintenance Aid (SMA), refer to the SMA documentation (included on the current edition of the Natural documentation CD).

If you are **not** using SMA, follow the instructions below.

This section explains how to:

- Copy data set COPY.JOB from tape to disk.
- Modify this data set to conform with your local naming conventions.

The JCL in this data set is then used to copy all data sets from tape to disk.

If the datasets for more than one product are delivered on the tape, the dataset COPY.JOB contains the JCL to unload the datasets for all delivered products from the tape to your disk.

After that, you will have to perform the individual install procedure for each component.

Step 1 - Copy data set COPY.JOB from tape to disk

The data set COPY.JOB (label 2) contains the JCL to unload all other existing data sets from tape to disk. To unload COPY.JOB, use the following sample JCL:

```
//SAGTAPE JOB SAG, CLASS=1, MSGCLASS=X
//* -----
//COPY EXEC PGM=IEBGENER
//SYSUT1 DD DSN=COPY.JOB,
// DISP=(OLD,PASS),
// UNIT=(CASS,,DEFER),
// VOL=(,RETAIN,SER=<Tnnnnn>),
// LABEL=(2,SL)
//SYSUT2 DD DSN=<hilev>.COPY.JOB,
// DISP=(NEW,CATLG,DELETE),
// UNIT=3390,VOL=SER=<vvvvvv>,
// SPACE=(TRK,(1,1),RLSE),
// DCB=*.SYSUT1
//SYSPRINT DD SYSOUT=*
//SYSIN DD DUMMY
//
```

Where:

```
<hilev> is a valid high level qualifier
<Tnnnnn> is the tape number
<vvvvvv> is the desired volser
```

Step 2 - Modify COPYTAPE.JOB

Modify the COPYTAPE.JOB to conform with your local naming conventions and set the disk space parameters before submitting this job:

- Set HILEV to a valid high level qualifier.
- Set LOCATION to a storage location.
- Set EXPDT to a valid expiration date.

Step 3 - Submit COPY.JOB

Submit COPY.JOB to unload all other data sets from the tape to your disk.

Installation Tape - VSE/ESA

The installation tape contains the dataset listed in the table below. The sequence of the dataset is shown in the Report of Tape Creation which accompanies the installation tape.

| Dataset Name | Contents |
|--------------|-------------------|
| NTCnnn.LIBR | LIBR backup file. |

The notation *nnn* in the dataset name represents the version number of the product.

Copying the Tape Contents to Disk

If you are using System Maintenance Aid (SMA), refer to the SMA documentation (included on the current edition of the Natural documentation CD).

If you are **not** using SMA, follow the instructions below.

This section explains how to:

- Copy data set COPYTAPE.JOB from tape to library.
- Modify this member to conform with your local naming conventions.

The JCL in this member is then used to copy all data sets from tape to disk.

If the datasets for more than one product are delivered on the tape, the member COPYTAPE.JOB contains the JCL to unload the datasets for all delivered products from the tape to your disk, except the datasets that you can directly install from tape, for example, Natural INPL objects.

After that, you will have to perform the individual install procedure for each component.

Step 1 - Copy data set COPYTAPE.JOB from tape to disk

The data set COPYTAPE.JOB (file 5) contains the JCL to unload all other existing data sets from tape to disk. To unload COPYTAPE.JOB, use the following sample JCL:

```
* $$ JOB JNM=LIBRCAT, CLASS=0,
* $$ DISP=D,LDEST=(*,UID),SYSID=1
* $$ LST CLASS=A,DISP=D
// JOB LIBRCAT
* **********
   CATALOG COPYTAPE.JOB TO LIBRARY
* **********
// ASSGN SYS004, NNN
                                            <---- tape address
// MTC REW,SYS004
// MTC FSF, SYS004, 4
ASSGN SYSIPT, SYS004
// TLBL IJSYSIN, 'COPYTAPE.JOB'
// EXEC LIBR,PARM='MSHP; ACC S=lib.sublib' <----- for catalog
// MTC REW,SYS004
ASSGN SYSIPT, FEC
/&
* $$ EOJ
```

Where:

NNN is the tape address

lib.sublib is the library and sublibrary of the catalog

Step 2 - Modify COPYTAPE.JOB

Modify COPYTAPE.JOB to conform with your local naming conventions and set the disk space parameters before submitting this job:

Step 3 - Submit COPYTAPE.JOB

Submit COPYTAPE.JOB to unload all other data sets from the tape to your disk.

Installation Tape - BS2000/OSD

The installation tape contains the dataset listed in the table below. The sequence of the dataset is shown in the Report of Tape Creation which accompanies the installation tape.

| Dataset Name | Contents |
|---------------------|------------------------------------|
| NTCnnn.PAMS | Natural Connection module library. |

The notation *nnn* in the dataset name represents the version number of the product.

Copying the Tape Contents to Disk

If you are not using SMA, use the procedure described below. In this procedure, the values specified below must be supplied.

To copy the datasets from tape to disk, perform the following steps:

1. Copy the Library SRVnnn.LIB from Tape to Disk

This step is not necessary if you have already copied the library SRV*nnn*.LIB from another Software AG tape. For more information, refer to the element #READ-ME in this library.

The library SRV*nnn*.LIB is stored on the tape as the sequential file SRV*nnn*.LIBS containing LMS commands. The current version *nnn* can be obtained from the **Report of Tape Creation**. To convert this sequential file into an LMS-library, execute the following commands:

```
/IMPORT-FILE SUPPORT=*TAPE(FILE-NAME=SRVnnn.LIBS, -
/ VOLUME=<volser>, DEV-TYPE=<tape-device>)
/ADD-FILE-LINK LINK-NAME=EDTSAM, FILE-NAME=SRVnnn.LIBS, -
/ SUPPORT=*TAPE(FILE-SEQ=3), ACC-METH=*BY-CAT, -
/ BUF-LEN=*BY-CAT, REC-FORM=*BY-CAT, REC-SIZE=*BY-CAT
/START-EDT
@READ '/'
@SYSTEM 'REMOVE-FILE-LINK EDTSAM'
@SYSTEM 'EXPORT-FILE FILE-NAME=SRVnnn.LIBS'
@WRITE 'SRVnnn.LIBS'
@HALT
/ASS-SYSDTA SRVnnn.LIBS
/MOD-JOB-SW ON=1
/START-PROG $LMS
/MOD-JOB-SW OFF=1
/ASS-SYSDTA *PRIMARY
```

Where:

<tape-device> is the device-type of the tape, e.g. TAPE-C4 <volser> is the VOLSER of the tape (see **Report of Tape Creation**)

2. Copy the Procedure COPY.PROC from Tape to Disk

To copy the procedure COPY.PROC to disk, call the procedure P.COPYTAPE in the library SRVnnn.LIB:

```
/CALL-PROCEDURE (SRVnnn.LIB,P.COPYTAPE), -
/ (VSNT=<volser>, DEVT=<tape-device>)
```

If you use a TAPE-C4 device, you may omit the parameter DEVT.

3. Copy all Product Files from Tape to Disk

To copy all Software AG product files from tape to disk, enter the procedure COPY.PROC:

```
/ENTER-PROCEDURE COPY.PROC, DEVT=<tape-device>
```

If you use a TAPE-C4 device, you may omit the parameter DEVT. The result of this procedure is written to the file 'L.REPORT.SRV'.

Installation Tape - VM/CMS

The installation tape contains the dataset listed in the table below. The sequence of the dataset is shown in the Report of Tape Creation which accompanies the installation tape.

| Dataset Name | Contents |
|--------------|-------------------------------|
| NTCnnn.TAPE | Natural Connection TEXT file. |

The notation *nnn* in the dataset name represents the version number of the product.

Copying the Tape Contents to Disk

- 1. To position the tape for the TAPE LOAD command, calculate the number of tape marks as follows: If the sequence number of NTC*nnn*.TAPE, as shown by the Report of Tape Creation, is *m*, you must position over 3*m* 2 tape marks (that is, FSF 1 for the first dataset, FSF 4 for the second, etc.)
- 2. Access the disk that is to contain the Natural installation files as disk "A".
- 3. Ask the system operator to attach a tape drive to your virtual machine at the address X'181' and mount the Natural Connection installation tape.
- 4. When the tape has been attached, enter the CMS command:

```
TAPE REW
```

Position the tape by entering the CMS command:

```
TAPE FSF m
```

where m is the number of tape marks and is calculated as described above (3m - 2).

5. Load the Natural Connection/CMS installation material by entering the CMS command:

```
TAPE LOAD * * A
```

Keep the tape drive attached to your virtual machine, because the tape is still needed during the installation procedure.

Installation Procedure

This section describes step by step how to install Natural Connection under the operating systems OS/390, VSE/ESA, BS2000/OSD and VM/CMS.

Step 1: Adjust Natural Parameter Module - Job I080

Specify the keyword parameter AM=PC for all printer files and work files you want to use for data transfer between the host and the PC. For example:

```
NTPRINT (7), AM=PC
NTWORK (7), AM=PC
```

Specify the parameter PC=ON either dynamically or in your Natural parameter module.

For information on using the parameters, refer to Profile Parameter Usage in the Natural Operations for Mainframes documentation.

For details on the parameters or modules, see the Natural Parameter Reference documentation or Using Optional Macros in a Natural Parameter Module in the Natural Operations for Mainframes documentation.

Step 2: Adapt Link Steps - Job I080

Adapt the link steps for online Natural.

• OS/390:

Add the following INCLUDE instruction and the corresponding DD-statements in the link instructions for the linkage editor:

INCLUDE NTCLIB(NTCPCAM3) mandatory

• VSE/ESA:

Add the following INCLUDE instruction and the corresponding sublibrary for Natural Connection in the search chain for the linkage-editor:

INCLUDE NTCPCAM3 mandatory

• BS2000/OSD:

Add the following INCLUDE instruction to the element LNATSHAR in NATnnn.JOBS:

INCLUDE NTCPCAM3, NTCnnn.MOD

Relink your Natural shared nucleus as described in Step 5: Link the Natural Nucleus in Installing Natural under BS2000/OSD in the Natural Installation Guide for Mainframes.

• VM/CMS:

The list of text files to be included in the Natural module or DCSS is contained in REXX program NAT\$LOAD EXEC (variable LOADLIST). To customize your Natural system, modify this EXEC with XEDIT by changing the LOADLIST as required.

Add the following statement to the program NAT\$LOAD EXEC or NATBLDS respectively.

LOADLIST = LOADLIST 'NTCPCAM3'

Relink your Natural nucleus with the procedure NATBLDM.

Installation Verification



To verify the successful installation of Natural Connection

- 1. Start Entire Connection on the PC and terminal emulation.
- 2. Invoke Natural on the mainframe.
- 3. Enter the terminal command %+ to activate the PC connection.
- 4. Use the Natural utility SYSTRANS (see the relevant documentation) to download Natural source code to the PC. For further information, see Transferring Natural Objects (Data Transfer) in the Terminal Emulation section of the Entire Connection documentation.
- 5. Verify that the downloaded program is now on your PC.

Preparing to Use Natural Connection

This section describes the tasks that must be accomplished to allow download and upload:

- Displaying Work File and Printer Settings
- Defining Work Files and Printers
- Activating the PC Connection
- Deactivating the PC Connection

In order to download and upload data, a work file must be designated as a PC file. To download reports, a printer must be designated as a PC printer.

Displaying Work File and Printer Settings

To display your current work file and printer settings, enter the Natural system command SYSFILE at the NEXT prompt.

This invokes the SYSTP utility and a screen similar to the following appears:

| 11: Use | | | ** | | | STP UTI | LITY **** tion - | 2003-01-21 TID DAEFTCI7 |
|------------|--------|-----------|---------|----------|-------|--------------|---------------------|------------------------------------|
| M N | o. | Туре | Name | Recfm | Lrecl | Blksz | Status | |
| | 1 | COMPLETE | CMWKF01 | VB | | 4628 | | or Input/Output |
| | 2 | COMPLETE | CMWKF02 | VB | | 4628 | | or Input/Output |
| | 3 | COMPLETE | CMWKF03 | VB | | 4628 | | or Input/Output |
| | 4 5 | COMPLETE | CMWKF04 | VB | | 4628 | | or Input/Output |
| | 5 6 | PC | | VB VB | | 4628 4628 | | or Input/Output |
| | 6 7 | PC PC | | VB VB | | 4628 | | or Input/Output or Input/Output |
| | | | | | | | | |
| Т | 'op | of List | | | | | | |
| Comm | and | d ===> | | | | | | |
| Ente | r-I | PF1PF2- | PF3P | F4PF | 5PF6 | 5PF7- | PF8PF9 | PF10PF11PF12 |
| Cont | . I | Help Menu | Exit S | el Po | s | - | + ++ | Print Work Canc |

The standard PC files are Work Files 5, 6 and 7 as shown in the example above.

For more information, see SYSTP Utility in the Natural Utilities documentation.

Defining Work Files and Printers

You can define work files and printers statically in your Natural parameter module, or dynamically when invoking Natural:

- Use the NTWORK macro or WORK parameter for work file definitions.
- Use the NTPRINT macro or PRINT parameter for printer definitions.

For detailed information on these macros and parameters, see the Natural Parameter Reference documentation.

Remember, however, that the download and upload modules provided by Natural Connection use Work File 7. For further information, see Transferring Natural Objects (Data Transfer) in the Terminal Emulation section of the Entire Connection documentation.

Activating the PC Connection

To upload and download data to/from a PC, the PC connection must be active. You activate the PC connection from the mainframe .



To activate the PC connection

Use the Natural terminal command %+.
 Or invoke Natural with the dynamic parameter PC=ON.
 Or use the SET CONTROL '+' statement in a Natural program.

With the terminal command %+, you can additionally set one or both of the following options:

| Opti | n Description |
|------|--|
| %+N | The PC connection is activated. In addition, no field names are sent when downloading or uploading data. |

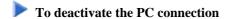
If you attempt to upload or download data without the PC connection being activated, the following message appears:

NAT1173 PC CONNECTION NOT ACTIVE

If you enter %+ and the PC connection is already active, the following message appears:

NAT1172 PC CONNECTION ALREADY ACTIVE

Deactivating the PC Connection



• Use the Natural terminal command %-.
Or use the SET CONTROL '-' statement in a Natural program.

Natural Statements Natural Statements

Natural Statements

This section lists the Natural statements required to process information between the mainframe and the PC by using Natural Connection.

For detailed information on these statements, refer to the relevant sections in the Natural Statements documentation.

The Natural statements that apply to Natural Connection can be divided into the following groups:

Transfer Data

- DOWNLOAD PC FILE (synonym for WRITE WORK FILE)
- UPLOAD PC FILE (synonym for READ WORK FILE)

Download Reports

- DISPLAY
- PRINT
- WRITE

Close a PC File

• CLOSE PC FILE (synonym for CLOSE WORK FILE)

Processing Work Files and Nested Loops

This section describes restrictions on the use of work file attributes, the support of work file formats and the impact of READ loops.

- Work File Format and Attributes
- Maximum File Transfer Record Length for Natural Connection
- Streaming
- Dynamic Variables in READ WORK FILE
- Nested READ Loops
- Subsequent READ Loops
- Buffer Allocation for Large Upload Records

Work File Format and Attributes

Below are the restrictions that apply to the use of work file attributes:

- Accessing PC work files is restricted to a fixed record length of 1073741823 bytes or 32767 bytes when
 using the statement WRITE WORK FILE VARIABLE. Depending on the Entire Connection version
 installed on the PC, additional restrictions may apply as described below.
- Natural Connection does not support work files of the type UNFORMATTED.
 A work file is always transferred in formatted mode and contains record-oriented data only. For a work file of the type UNFORMATTED, at FILE OPEN, Natural Connection switches to the type FORMATTED and executes any WRITE WORK FILE statement with the option VARIABLE. To transfer byte-streamed data, see Streaming below.

Maximum File Transfer Record Length for Natural Connection

The maximum record length supported for file transfer with Natural Connection Version 4.1 depends on the version of Entire Connection installed on the PC.

For Entire Connection up to Version 4.2, the maximum record length is limited by the number of bytes that can be displayed on the appropriate 3270 model. For example, for a 3270 Model 2 device the record length is 24*80 = 1920 bytes. Since all data buffers are enclosed by a header and trailer, the resulting net record length is 1887 bytes.

For Entire Connection Version 4.3.1, the maximum record length is limited to 32 KB -1 byte = 32767 bytes.

As of Entire Connection Version 4.3.2 Patch Level 1 and Entire Screen Builder Version 5.2.1, the maximum record length is increased to 1 GB - 1 byte = 1073741823 bytes. But writing work files in variable format (write work variable) is still restricted to a maximum record length of 32 KB - 1 byte.

Streaming

Entire Connection provides the option to transfer byte-streamed data that are non-record-oriented. A byte-streamed data transfer is activated when a READ WORK FILE or WRITE WORK FILE statement is coded with only one single operand of binary format.

Below is information on:

• Downloading and Uploading Binary Data

Downloading and Uploading Binary Data

Binary data is usually object code or executable code that does not contain displayable or printable characters. To prevent standard character translations being performed during data transfer, Natural and Entire Connection use special methods for transferring binary data.

To download binary data

- Define a binary variable.
- If the last block of downloaded data contains less data than the block size chosen, insert X'FF' at the position that marks the end of the binary data. (If you omit X'FF', the rest of the last block will be filled with X00.)

To upload binary data

- Define a binary variable.
- Remove X'FF from the last block. X'FF marks the end of the binary data.

Dynamic Variables in READ WORK FILE

If you define a dynamic variable of the format binary or alphanumeric as operand of a READ WORK FILE statement, when processing the corresponding READ loop, any resize operation on this variable will only be valid until the next READ is performed. While processing the READ, Natural resizes all dynamic variables to the size they had at OPEN time. This is required in the OPEN process which determines the record layout. The record layout is mandatory for processing the corresponding work file. The record layout is valid until the next CLOSE operation occurs.

Exception:

An internal resize cannot be performed for inner loops if nested READ loops are processed on the same work file. See also the programming recommendations about nested loops below. If a dynamic variable of Size 0 is used as the only operand of a READ WORK FILE statement, Natural issues the OPEN error NAT1500.

Nested READ Loops

Do not specify nested READ loops on one work file. The result of the inner loop(s) can be unpredictable if the operands of the inner loop do not correspond to the operands of the outer loop. The reason is, that all records uploaded from the PC are processed in the format that was determined during the OPEN of the outermost loop.

Below are example programs that demonstrate the unpredictable results the inner loop(s) of nested READ loops can have:

- Example of Inner READ Loop
- Example of Read Loop and CALLNAT

Example of Inner READ Loop

In the example program PCNESTED, during READ processing, another READ is performed:

```
/* PCNESTED
/*
DEFINE DATA LOCAL
1 #REC1 (A) DYNAMIC
1 #NUMBER (N10)
END-DEFINE
*
MOVE ALL 'TEST RECORD 1' TO #REC1 UNTIL 100
READ WORK FILE 1 #REC1
READ WORK FILE 1 #NUMBER
DISPLAY #NUMBER
END-WORK
END-WORK
END-WORK
```

Example of Read Loop and CALLNAT

In the example program PCMAIN and subprogram PCRSUB01, during READ loop processing, an external object is called:

```
/* PCMAIN
/*
DEFINE DATA
LOCAL
 1 RECL (A2000)
 1 REDEFINE RECL
   2 RECNR (N4)
 1 CO (N4
END-DEFINE
WRITE WORK 1 COMMAND
 'SET PCFILE 2 UP DATA C:/TSTPCAM/PCMAIN.TXT'
READ WORK 2 RECL
 DISPLAY RECL (AL=72)
 CALLNAT 'PCRSUB01' RECL
END-WORK
END
```

Subprogram PCRSUB01

```
/*Subprogram PCRSUB01
/*
DEFINE DATA
PARAMETER
1 RECL (A2000)
LOCAL
1 #CC1 (A20)
1 #CC2 (N4)
*
END-DEFINE
READ WORK 2 RECL
#CC1 #CC2
DISPLAY #CC1 #CC2
END-WORK
END
```

Subsequent READ Loops

If a READ loop is terminated by a conditional ESCAPE, close the work file explicitly with the CLOSE WORK FILE statement so that the same work file can be processed in a subsequent READ in the same object. **Exception:**

You can omit the CLOSE WORK FILE if you need not read the file again from the beginning, and if the subsequent READ uses the same record layout as the preceding one.

Below is an example that demonstrates how to correctly code a program with two READ loops on one work file:

• Example of Loop with ESCAPE and CLOSE

Example of Loop with ESCAPE and CLOSE

In the example program PCESCAPE, the work file is explicitly closed after the first READ loop has been terminated by ESCAPE BOTTOM so that the second READ loop must reopen the work file:

```
/*PCESCAPE
DEFINE DATA
T<sub>1</sub>OCAT<sub>1</sub>
  1 #CC1
                  (A20)
  1 #CC2
                 (A40)
  1 #COUNTER
END-DEFINE
READ WORK 2 #CC1
 DISPLAY #CC2
  ADD 1 TO #COUNTER
  IF #COUNTER GE 3
    ESCAPE BOTTOM
  END-IF
END-WORK
CLOSE WORK FILE 2
READ WORK 2 #CC2
 DISPLAY #CC2
END-WORK
END
```

Buffer Allocation for Large Upload Records

If Natural Connection uploads a record that is larger than one physical block, Natural Connection collects all blocks that belong to the record in the appropriate work file area. The record will then be decompressed and passed to the Natural data area.

The total space allocated by all temporary buffers is up to 3 times the size of the record to be uploaded.

Example Statement:

```
READ WORK FILE 1 #var
```

where 1 is the number of the work file and #var a variable of the Format B 10000. In this case, the temporary Natural work area requires approximately 30000 bytes.